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AUTHOR Crutchfield, Fran
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ABSTRACT

This learning packet, one in a group of eight, was developed by the Jockey's Ridge State Park in North Carolina for Grades 4-6 to learn about animal adaptation and behavior in the dune environment. Loose-leaf pages are presented in 10 sections that contain: (1) introductions to the North Carolina State Park System, the Jockey Ridge State Park, the park's activity packet, and the taxonomy of living organisms; (2) a summary of the activities that includes major concepts and objectives covered; (3) a pre-visit activity to explain the terms "adaptation" and "camouflage"; and (4) an on-site activity to identify animal tracks and animal behavior; (5) a post-visit activity to describe six animals and two of their adaptations to the harsh dune environment; (6) a list of 30 related vocabulary words; (7) fact sheets for 10 animals in the dune environment; (8) necessary park and parental permission forms for the visit; and (9) blank pages for taking notes. Contains 16 references. (MDH)

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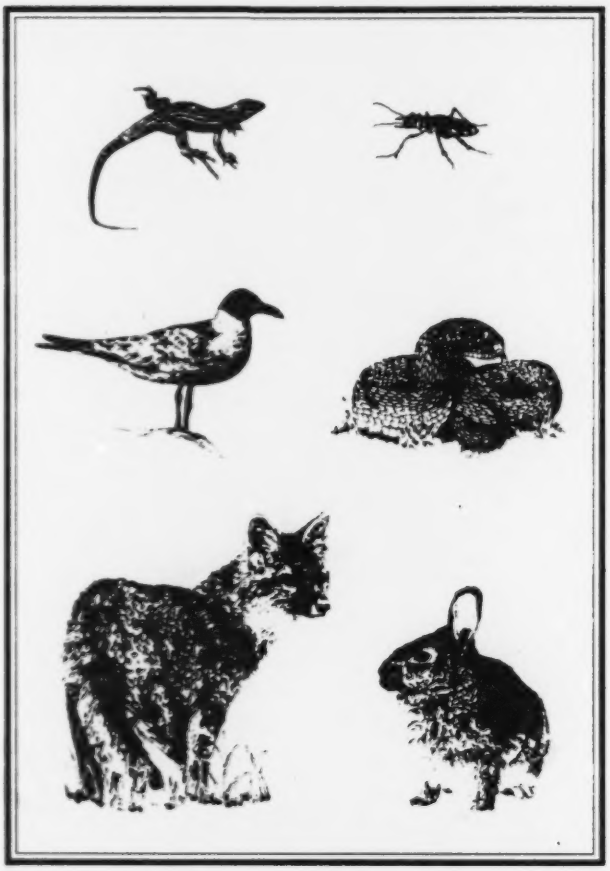

THE SAND

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Jockey's Ridge State Park

An Environmental Education Learning Experience

Designed for Grades 4-6

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On the floors of sand, ...slopes,
I find patterns made by the
feet of visiting birds.
...There is always something poetic
and mysterious to me about
these tracks in the pits of the dunes;
they begin at nowhere,
sometimes with the faint impression
of an alighting wing, and vanish
as suddenly into the trackless
nowhere of the sky.

- Henry Beston, *The Outermost House*

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This Environmental Education Learning Experience
was developed by

Fran Crutchfield
Lead Interpretation and Education Ranger
Jockey's Ridge State Park

N.C. Division of Parks and Recreation
Department of Environment, Health, and Natural Resources

James B. Hunt Jr.
Governor

Jonathan B. Howes
Secretary

Other Contributors . . .

Park volunteers;

The N.C. Department of Public Instruction;

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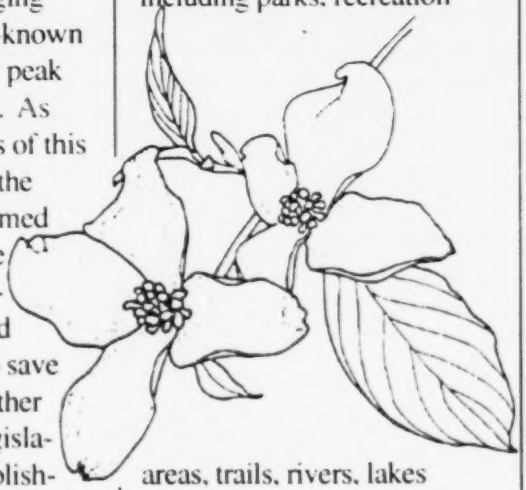
Introduction to the North Carolina State Parks System

Preserving and protecting North Carolina's natural resources is actually a relatively new idea. The seeds of the conservation movement were planted early in the 20th century when citizens were alerted to the devastation of Mount Mitchell. Logging was destroying a well-known landmark - the highest peak east of the Mississippi. As the magnificent forests of this mile-high peak fell to the lumbermen's axe, alarmed citizens began to voice their opinions. Governor Locke Craig joined them in their efforts to save Mount Mitchell. Together they convinced the legislature to pass a bill establishing Mount Mitchell as the first state park.

That was in 1915. The North Carolina State Parks System has now been established for more than three-quarters of a century. What started out as one small plot of public land has grown into 59 properties across the state, including parks, recreation



areas, trails, rivers, lakes and natural areas. This vast network of land boasts some of the most beautiful scenery in the world and offers endless recreation opportunities. But our state parks system offers much more than scenery and recrea-tion. Our lands and waters contain unique and valuable archaeological, geological and biological resources that are important parts of our natural heritage.

As one of North Carolina's principal conservation agencies, the Division of Parks and Recreation is responsible for the more than 125,000 acres that make up our state parks system. The Division manages these resources for the safe enjoyment of the public, and protects and preserves them as a part of the heritage we will pass on to generations to come.

An important component of our stewardship of these lands is education. Through our interpretation and environmental education services, the Division of Parks and Recrea-tion strives to offer enlighten-ing programs which lead to an understanding and appreciation of our natural resources. The goal of our environmental education program is to generate an awareness in all individuals which cultivates responsible stewardship of the earth.

For more information contact:

NC Division of Parks and Recreation
P.O. Box 27687
Raleigh, NC 27611-7687
919/ 733-PARK

Introduction to Jockey's Ridge State Park

Jockey's Ridge is the tallest active sand dune system along the Atlantic coast of the United States. Its height varies from 110 feet to 140 feet, depending on weather conditions. Shifting winds blow billions of grains of sand in varying directions, constantly changing the shape and size of the dune.

Jockey's Ridge is an excellent example of a medano - a large, isolated hill of sand, asymmetrical in profile and lacking vegetation. In the areas around the dunes, dense thickets have formed providing habitats for a variety of wildlife. The park provides an outdoor classroom for students to study and learn about a harsh coastal environment.

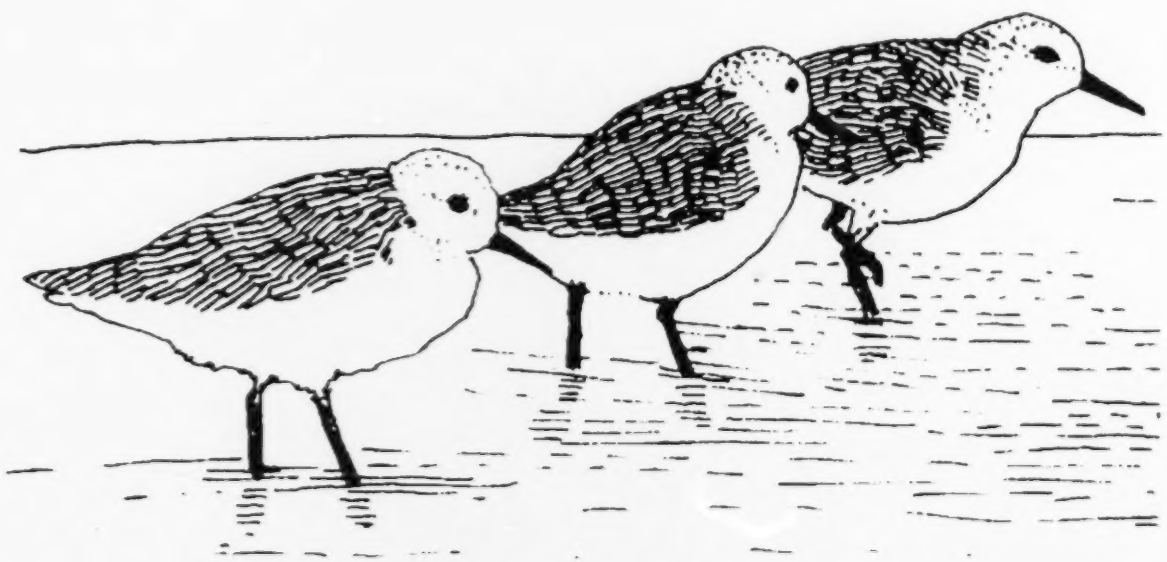
Jockey's Ridge State Park is located in the town of Nags Head, on the Outer Banks of North Carolina.

Many stories surround the origin of the name of Jockey's Ridge. The most popular stems from the early inhabitants' practice of capturing wild ponies and racing them on the flat surface at the base of the dune. The steep sides of the dune were used as a grandstand for spectators.

In the early 1970's, when development threatened the dunes, many local citizens and visitors took steps to help preserve and protect the dunes. "People to Preserve Jockey's Ridge" was formed and the campaign to "Save Our Sand Dune" was on. Appeals were made to local and state governments and a petition was presented to government officials. In 1975 Jockey's Ridge was established as a North Carolina State Park with the purchase of 152 acres. Additional purchases have brought the park to today's size of 385 acres.

Kids, both large and small, enjoy playing on this huge pile of sand. Excellent views of coastal Carolina and spectacular sunsets are just a few of the rewards of a hike to the top.

For more information, contact:
Jockey's Ridge State Park
P. O. Box 592
Nags Head, NC 27959
(919) 441-7132



Introduction to the Activity Packet for Jockey's Ridge State Park

The environmental education learning experience, Tracks in the Sand, was developed to provide environmental education through a series of hands-on activities geared to Jockey's Ridge State Park. This activity packet is designed for school grades 4 to 6, however, it can be adapted for other grade levels. This packet meets curriculum objectives of the standard course of study established by the North Carolina Department of Public Instruction. It includes three types of activities:

1) pre-visit activities
2) on-site activities
3) post-visit activities.

On-site activities will be conducted at the park, while pre-visit and post-visit activities are designed for the classroom environment. These activities may be performed independently or in a series to build upon students' newly gained knowledge and experiences.

The environmental education learning experience, Tracks in the Sand, will expose students to the following major concepts:

- **Animal adaptations**
- **Reading animal signs**
- **Dune environment**
- **Preservation of natural areas**

The North Carolina Department of Public Instruction is in the process of revising the curriculum for all subject areas, therefore specific curriculum objectives are not listed. Each activity does include, however, a listing of the curriculum study areas which are used in that activity.

Vocabulary words used throughout this environmental education learning experience appear in **bold** type the first time they are used in each activity. These words and their definitions may be found in the vocabulary list at the back of the activity packet. A list of the reference materials used in developing the activities follows the vocabulary list.

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NOTE: The on-site activity requires hiking which could expose the students to hot, humid conditions and ticks, sunscreen and hats are advised. Accessibility to some of these areas is difficult for persons with special needs.

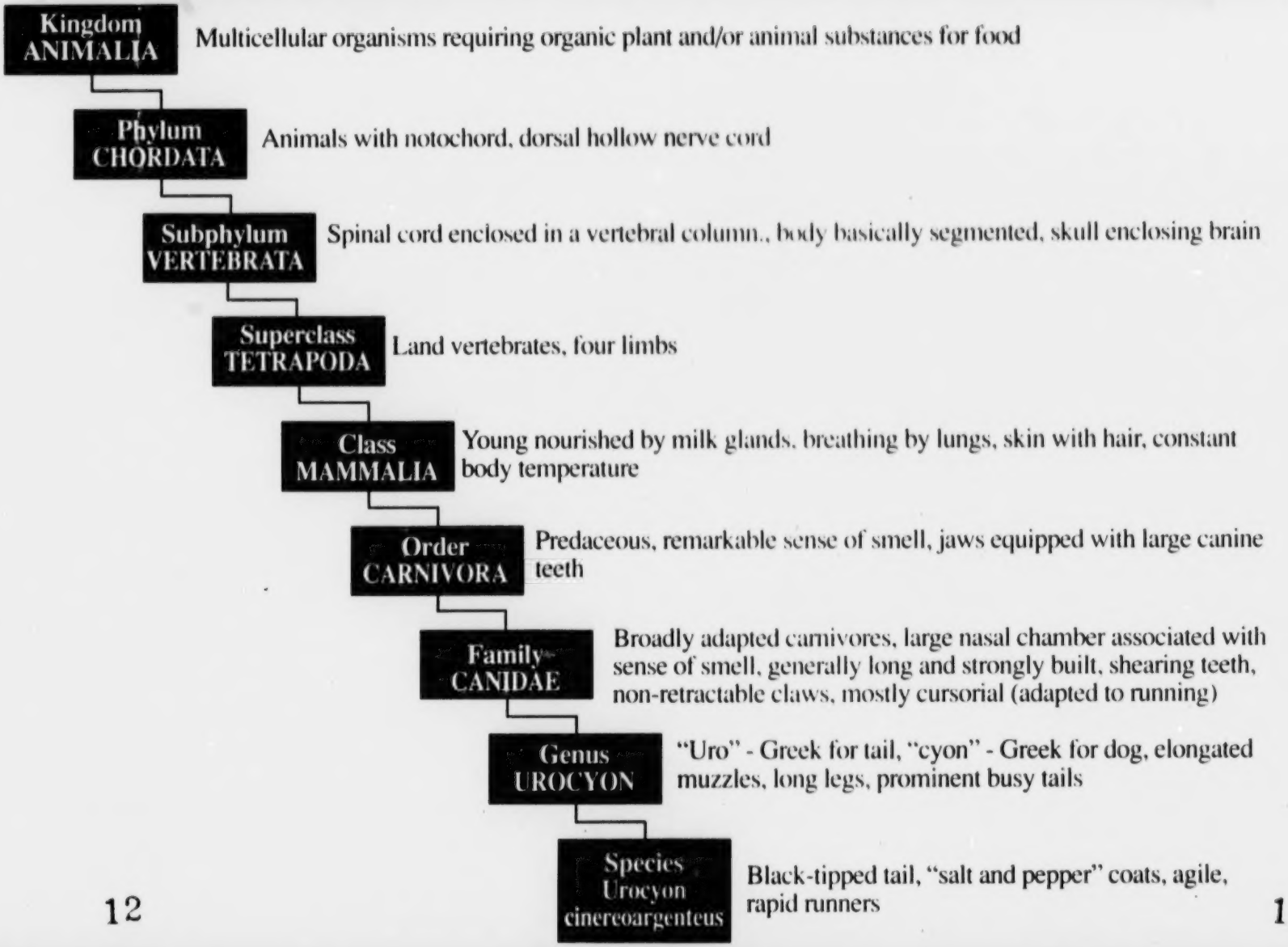
Introduction to Taxonomy

As many as 10 million known living organisms share planet Earth as home. Each of these living things has been classified by similar characteristics into large groups known as kingdoms. There are five major kingdoms:

1) Animalia (mammals, insects, birds, reptiles, etc.);
2) Plantae (plants);
3) Fungi (mushrooms, molds, yeasts, etc.);
4) Protista (unicellular algae, protozoans); and
5) Monera (bacteria and blue-green algae).

These kingdoms are systematically divided several times, into more closely related groups known as taxonomic divisions. Individual organisms within a taxonomic division share similar characteristics with other individuals within the group. The principle taxonomic divisions are kingdom, phylum, class, order, family, genus and species. Types of individual animals or plants are species or specific organisms. Species in Latin means "kind". So in simple terms, species are different kinds of organisms. Often species are named for the scientist who classified them or for a unique characteristic of the species. The table on page 1.5 represents the taxonomic divisions for a gray fox.

Taxonomy of a Gray Fox


Kingdom ANIMALIA
Multicellular organisms requiring organic plant and/or animal substances for food
Phylum CHORDATA
Animals with notochord, dorsal hollow nerve cord
Subphylum VERTEBRATA
Spinal cord enclosed in a vertebral column., body basically segmented, skull enclosing brain
Superclass TETRAPODA
Land vertebrates, four limbs
Class MAMMALIA
Young nourished by milk glands, breathing by lungs, skin with hair, constant body temperature
Order CARNIVORA
Predaceous, remarkable sense of smell, jaws equipped with large canine teeth
Family CANIDAE
Broadly adapted carnivores, large nasal chamber associated with sense of smell, generally long and strongly built, shearing teeth, non-retractable claws, mostly cursorial (adapted to running)
Genus UROCYON
"Uro" - Greek for tail, "cyon" - Greek for dog, elongated muzzles, long legs, prominent busy tails
Species Urocyon cinereoargenteus
Black-tipped tail, "salt and pepper" coats, agile, rapid runners

Activity Summary

The following outline provides a brief summary of each activity, the major concepts introduced and the objectives met by the completion of the activity.

I. Pre-Visit Activity

Surprise Terrarium

Students will observe a live animal demonstrating camouflage techniques in a terrarium.

Major concepts:

- Adaptations
- Habitat
- Survival

Objectives:

- Explain what the terms adaptation and camouflage mean.
- Name three adaptations of animals.
- Describe two reasons adaptations are important to animals.

II. On-Site Activity

Track and Animal Sign Search

While on a nature hike through Jockey's Ridge State Park, students will search for the various signs of animals and make plaster castings from tracks found.

Major concepts:

- Animal signs
- Track identification
- Animal behavior
- Observation skills

Objectives:

- Identify at least three animal tracks.
- Locate and observe three other animal signs.
- Describe how an animal's sign can be used to learn about an animal's behavior.

III. Post-Visit Activity

Animal Match-up

Through a matching game, students will match animals of the dune environment with their adaptation.

Major concepts:

- Animal adaptations
- Animal behavior

Objective:

- Describe six animals and two of their adaptations to the harsh dune environment.

Pre-Visit Activity #1 — Surprise Terrarium

Curriculum Objectives:
Grade 4
- Communication Skills: effective listening, speaking and viewing skills
- Science: adaptation to environment, animal characteristics

Grade 5
- Communication Skills: listening, speaking and viewing comprehension, study skills
- Guidance: group interaction

Grade 6
- Communication Skills: listening, speaking and viewing comprehension, study skills
- Guidance: group interaction

Location: Classroom

Group Size: 30 students

Estimated Time: 20 minutes

Appropriate Season: Spring

Credits:
Surprise Terrarium was modified from Project Wild, Elementary Activity Guide.

Materials:
Provided by the educator:
terrarium, photo of Jockey's Ridge (may be borrowed from the park), an animal that is camouflaged in the terrarium (grasshoppers, beetles, worms, etc.), an animal that is not camouflaged (lady bug, garden spider, monarch butterfly, etc.), photographs or magazine pictures of animals

Major Concepts:
- Adaptations
- Habitat
- Survival

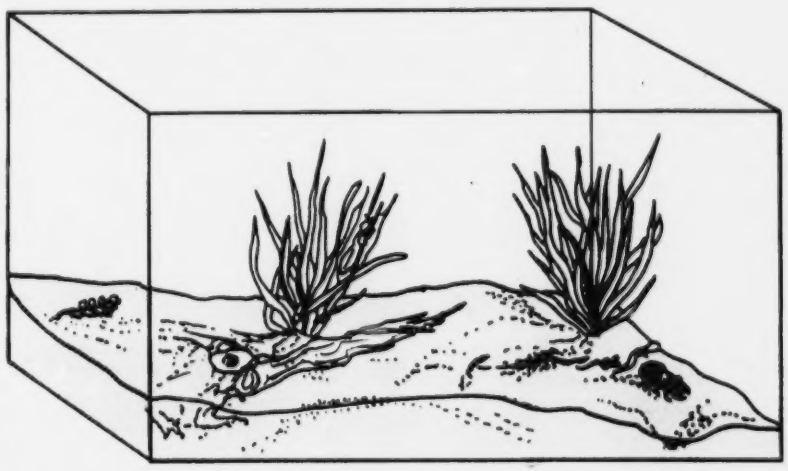
Objectives:
- Explain what the terms adaptation and camouflage mean.
- Name three adaptations of animals.
- Describe two reasons adaptations are important to animals.

Educator's Information:

One of the most important characteristics that help living things **survive** is their ability to adapt. All living organisms must adapt to climate, soils, water, vegetation, other life forms and other ecological factors.

Many of the animals of Jockey's Ridge have **adapted** to the harsh dune **environment** by using **camouflage** as a means of survival. For example, many insects and mammals are light in color to blend in with the sand. The rabbits are the same brownish-gray color as the **thicket** areas in which they live and the gray color of the gray fox camouflages them in twilight as they search for food. For additional information on adaptations of animals found at Jockey's Ridge State Park, see the fact sheets in the Appendix.

Animals that use camouflage techniques can be particularly interesting and visually compelling to young students as a means of illustrating the concept of adaptation. The main purpose of this activity is for students to recognize that animals have adaptations to increase their ability to survive in a particular environment.



Instructions:

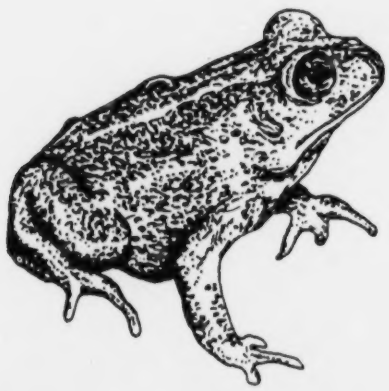
1. Make a "surprise" terrarium for your class. The terrarium should contain vegetation, an animal that is difficult for the students to see and an animal that is easily seen. The vegetation should be of similar color to the camouflaged animal.

2. Have students observe the terrarium and ask the group to describe what they see. After everyone has seen the animals, discuss how animals are camouflaged and how this adaptation is important. Also, discuss the other adaptations the animals in the terrarium have.

3. Show pictures of other animals. Discuss each animal's adaptations (physical and/or behavioral), and how the adaptations help them to survive.

4. Show the class a picture of Jockey's Ridge. Ask them to list the animals they think might live there and the adaptations those animals might therefore have. Write the comments on the board.

5. If the animals for the terrarium were brought into the classroom from the wild, the students should participate in releasing them. Remind the students that all things have a home and a territory. We've briefly taken these wild animals from their homes, so it's important to return them there. But remember, some animals should never be taken from their environment if it jeopardizes their lives. Remind them that we should always return an animal to the place where we picked it up, so it will be in its own territory and not some other animal's. Discuss human responsibilities for taking care of animals and their environment.



Jockey's Ridge State Park, NC

On-Site Activity #1 Track and Animal Sign Search

Curriculum Objectives:
Grade 4
- Communication Skills: listening skills, problem-solving, interpret visual information
- Guidance: group interaction
- Science: living things, animal characteristics, adaptations to environment, ecology
- Social Studies: group participation skills, effective listening, decision making

Grade 5
- Communication Skills: listening skills, problem-solving discussions, interpret visual information
- Guidance: group interaction
- Social Studies: group participation skills, effective listening, decision making

Grade 6
- Communication Skills: listening skills, problem-solving discussions, interpret visual information
- Guidance: group interaction
- Science: communities, ecosystems
- Social Studies: group participation, effective listening, decision making

Location: Thicket area around Jockey's Ridge

Group Size: 30 students

Estimated Time: 1 hour

Appropriate Season:
Fall or spring

Materials:
Provided by the park:
plaster of Paris, mixing container, water, spoon, ruler, track identification book

Provided by the educator:
Per student: "Track Identification" fact sheet, "Tracking" worksheet, clipboard, pencil

Special Considerations:
This activity requires a hike through the thickets. It is recommended that a park ranger lead the hike unless the educator is very familiar with the terrain and the activity proposed. Students with physical disabilities will have difficulty with this activity. It is recommended that students wear appropriate clothing especially from late May until September when the weather is hot and humid. Students should be instructed to stay on the trail behind hike leader (to prevent contact with poison ivy and ticks, and so that tracks are not disturbed before everyone has a chance to observe them).

Major Concepts:
- Animal signs
- Track identification
- Animal behavior
- Observation skills

Objectives:
- Identify at least three animal tracks.
- Locate and observe three other animal signs.
- Describe how an animal's sign can be used to learn about an animal's behavior.

Educator's Information:

By studying the **signs**, such as **tracks**, nests, burrows, droppings and food litter, left by animals, you can often figure out what kind of animal made them. You can also determine what they were doing, where they were going, what they preyed upon and what preyed upon them.

In this activity, the students will hike through a **thicket** area that surrounds the dunes to search for tracks and other signs made by the animals that live in this harsh **environment**. As tracks are seen, discussions about that animal's **adaptations**, habits, food sources, etc. will occur (see the appendix for information on the animals). Plaster castings will be made from some of the tracks and taken back to the classroom.

Open sand areas surrounded by dense thickets make Jockey's Ridge State Park a great place to look for evidence of **wildlife**. The dry sand often distorts the size and shape of the track but in the early morning, the low areas are usually still damp enough so that good tracks can be seen.

Remember, most children will not mind if the identification of the track or sign is not determined - just seeing it in its natural **habitat** will be a joy and a learning experience in itself.

Instructions:

1. Introduce the activity: We are going on a hike to see animal signs left by animals that live here at Jockey's Ridge. We will be looking for tracks, paths, broken twigs, **scat**, nests, burrows, food litter, etc. We will keep a running log of how many things we find and what they are. When we find a good track, we will circle it in the sand and use the "Tracking" worksheet to try to identify the animal. If we find a really clear track, we will try to make a plaster cast of it.

Read the Student's Information out loud, followed by some quick rules: Always stay behind the leader during the hike. Watch where you step, so you won't step on a good track. Be especially careful around the "circled" tracks.

2. Separate the children into groups of five to six each with one adult leader per group, if possible. Have them write their group number on the top of their worksheet.

3. Start the hike and when the first set of tracks is found, circle them in the sand and go through the worksheet as a complete group to try to identify the track. Make sure everyone understands how to fill in the worksheet.

4. When the next set of tracks is found, have Group 1 try to identify it while the rest of the class observes. Have them explain their identification process using the worksheet. At each new set of tracks, have a new group try to identify them. Remind each group to circle their tracks so no one will step on them.

5. Make a plaster cast of any of these tracks, if it is appropriate. The procedure for making plaster castings from animal tracks:

a. Select a clear track. Remember, moist sand will usually show tracks best.

b. In a large cup mix plaster of Paris, adding water slowly until it is as thick as pancake batter.

c. Stir continuously.

d. Carefully pour the mixture onto the track until it is completely covered.

e. Let the plaster harden 15-30 minutes.

f. Carefully lift and remove the casting from the ground.

g. Brush away loose sand.

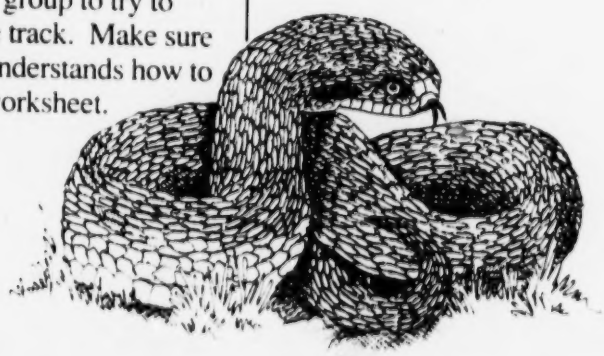
6. Continue the hike with all students keeping a log of what they see, not only of tracks, but other animal signs as well. Discuss all the animal tracks pictured on the "Track Identification" fact sheet.

7. At the end of the hike, discuss:

a. the number and diversity of animals and animal signs found,

b. the importance of this habitat to the animals, and

c. the importance of Jockey's Ridge State Park in protecting this habitat.



Student's Information:

To discover animal tracks in the sand or to come across footprints along the wet edge of a pond or sound is almost as exciting as seeing the creatures that made them. In fact, it may be more so, because unless you are lucky, or very well concealed, an animal will flee at the first hint of your presence.

Tracks, on the other hand, remain waiting to be examined, measured, and followed. Infrequent glimpses of an animal cannot tell you much about its habits and **behavior**, but tracks can.

The immediate impulse upon finding a track is to ask what made it. However, there are many questions to ask, even if one can identify the tracks, because knowledge about any animal increases with observations about where it's been, what it's been doing, and where it's going.

One of the first questions has to do with habitat - is the track near a pond? the sound? on the top of a dune? deep in the thicket? The answer eliminates some track-maker possibilities. You would not expect to find a raccoon track on the top of the dune any more than a squirrel track at the edge of the sound.

How big is the print and how deeply embedded? Sometimes, especially in deep sand, it is unclear whether a print was made by a single foot, or by all four feet landing together in the same spot. At this point it is necessary to decide whether you are looking at one large footprint, like that of a dog, or a pattern of footprints like those of a squirrel in which all four feet land quite close together. Once the relative size of the footprints is determined, one can guess the approximate size of their owner.

Individual footprints can quickly settle the mystery of who made them if the prints are clear. However, they rarely are clear, because rain, wind and sand movement tend to blur distinct features. Sometimes the prints are obliterated by excited trackers - so step carefully!

Details to notice that will help identify the track include:

- shape, length, and width
- number of toes
- presence or absence of toenail marks, and
- shape and number of pads.

Look at the shape of the animal footprints. Sometimes this alone will tell you the direction the animal went. If the tracks show toe or claw marks, these will point in the direction of travel. If toes or claws are not visible, look for the slight pile up of sand at the back of the tracks, caused by the pushing back of the animal's feet as it went forward.

As habitat, size of track, and footprint are being examined, so too should the pattern of the track. For many trackers, this is the most important clue. Although any animal may speed up or slow down, which can alter its track pattern, most animals typically fit into one of four distinct ways of moving: walking/ trotting, running/galloping, hopping/ bounding, or waddling.

Look at the pattern and direction of the track. Does the path follow a fairly straight route toward some seen or unseen destination, with the tracks evenly spaced? If so, the animal was probably neither pursuing nor being pursued. Does the pattern and spacing suddenly extend, showing that the animal sped up? Does the animal go under low branches, around them, or step over them (hint as to its height)? Do the tracks end at a tree?

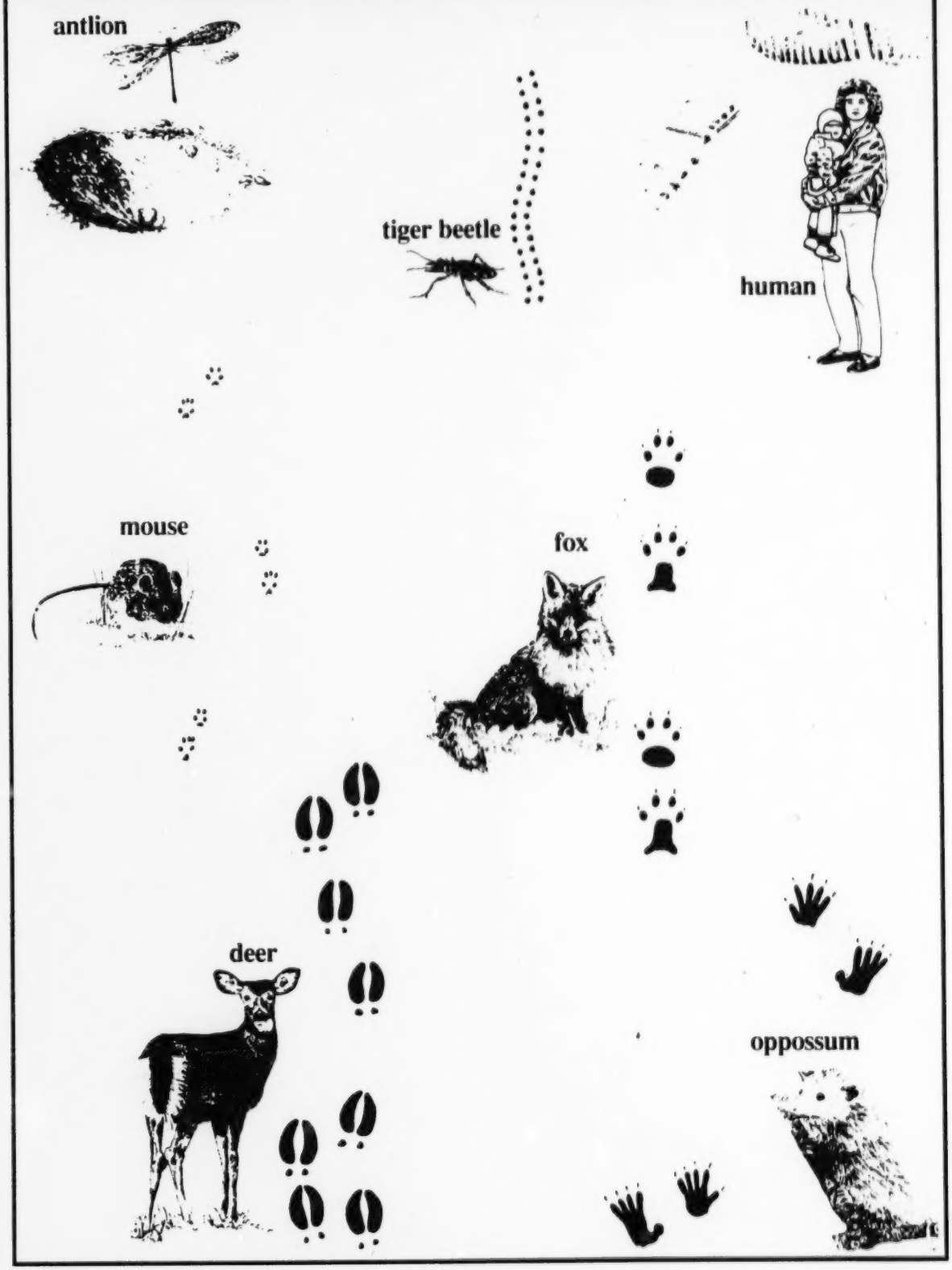
Identifying the tracks gives great satisfaction, but following them reveals a chapter in the animal's life otherwise closed to most of us. Enjoy your hike.

Tracking Worksheet

Group # ☐

Characteristics	TRACK Likely Animal	TRACK Likely Animal	TRACK Likely Animal
Habitat: thicket, sound, pond, dune, grass, etc.			
Track Size: large, small, overlapping each other, etc.			
Print: hoof, webbed foot, pad, claws, tail, etc.			
Track Pattern: waddling, walking/trotting, running/galloping, bounding/hopping, changing between these, etc.			
Track Route: where headed, fairly straight, meandering, under branches, to pond, to tree, etc.			
Other Signs: food litter, scat, feathers, fur, burrow, digging, nest, etc.			
Likely Animal-Type: bird, mammal, reptile, insect, etc.			
Other:			

Track Identification Fact Sheet



Track Identification Fact Sheet

Post-Visit Activity #1 — Animal Match-Up

Curriculum Objectives:
Grade 4
- Communication Skills: viewing and reading comprehension
- Science: living things, animals, adaptation to environment
- Social Studies: organize and analyze information, draw conclusions

Grade 5
- Communication Skills: viewing and reading comprehension
- Guidance: group interaction
- Social Studies: organize and analyze information, draw conclusions

Grade 6
- Communication Skills: viewing and reading comprehension
- Guidance: group interaction
- Science: ecology, communities, ecosystem
- Social Studies: organize and analyze information, draw conclusions

Location: Classroom

Estimated Time: 20 minutes

Appropriate Season: Any

Group Size: 30 students

Materials:
Provided by the educator: fact sheets, tape
Per group: "Animal Pictures" worksheets, "Animal Adaptation" clues

Credits:
Adapted from Ranger Rick's NatureScope, Discovering Deserts.

Major Concepts:
- Animal adaptations
- Animal behavior

Objectives:
- Describe six animals and two of their adaptations to the harsh dune environment.

Educator's Information:

Students will use knowledge acquired in previous activities and supplied facts to determine how animal "parts" and **behaviors** work together to create an animal that is **adapted** to a harsh dune **environment**. See Pre-Visit Activity #1, Surprise Terrarium and the fact sheets in the Appendix.

Instructions:

1. Copy the "Animal Adaptation" clues and cut them apart. Copy the "Animal Pictures" worksheets. Make one set for each group of two to three students.

2. Read the following information to the students:

An animal's **survival** depends upon its ability to adapt to a particular environment. Animals can adapt to climate, soil, water, vegetation and even other animals. One of the most effective ways to adapt is by **camouflage**. Other examples of adapting are: escaping extreme temperatures by digging into soil and coming out at night, hibernation during the winter, developing specialized body parts to help escape **predators** or capture **prey**, or even developing a method of making themselves unattractive to eat.

3. Divide the class into groups. Give each group a set of the adaptation clues and the "Animal Pictures" worksheet.

4. Explain to the students that each clue is an adaptation of an animal found at the park. Each group must figure out which three clues describe one of the animals pictured. They should lightly tape their clues below the appropriate picture and name the animal.

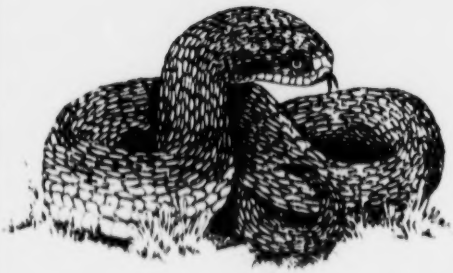
5. The object of the activity is to correctly fit the clues to the animals they describe and name the animals. Note: The students may use the fact sheets in the Appendix. When a group has finished matching the clues and identifying the animals, they should raise their hands and the educator will verify their answers. If one or more answers is not correct, the group should continue working until they have successfully completed the activity.

6. After all the groups are finished, discuss the correct answers.

Animal Pictures Worksheet

On each of the small sheets of paper is a clue which describes an adaptation of one of the animals below. Match three clues to each animal and lightly tape them in place. Write the correct animal name above the clues.

Animal Pictures Worksheet



Animal Pictures Worksheet

Animal Adaptation Clues

My large pincer-like jaws are used to grasp my prey.

I have an upturned snout which I use for digging up toads that have buried into the sand.

I stamp my hooves and snort loudly to warn others of approaching danger.

I flap my pouch to keep cool in the summer (like a dog pants).

My big ears do more than just pick up sound waves. They also help keep me cool during the summer by radiating heat.

My webbed feet and short legs make me an excellent swimmer, but not very good at walking on land.

My grayish-brown fur helps me to blend in with my surroundings; my distant relative, who lives in cold mountain areas, has fur that turns white in the winter.

A sharp ridge or spade on each of my hind feet helps me dig in the sand.

I dig down in the sand and become dormant during hot dry spells (this is called estivation). When it begins to rain the vibrations from the raindrops wake me up.

My footprint looks like a hand and I have almost no hair on my prehensile tail.

My large pouch-like bill (it can hold up to 2 gallons of water) is adapted for catching fish.

I escape the extreme weather conditions of the dunes by digging down 2-3 feet in the sand.

I obtain all my water needs from the toads I eat.

When in danger, I make myself very unattractive to my predator - I defecate, drool, give off a bad smell, and then finally "play dead". They certainly won't want to eat me!

I can mature from egg to adult in only two weeks and I can survive an enormous amount of water loss (up to 40%).

When young, white spots on my back look like filtered sunlight and help me to stay hidden from danger.

As soon as I am born, I crawl up to my mother's pouch where I stay until I am 2-3 months old.

When in danger I puff up my neck and hiss loudly to scare my predators away. If that does not work, I make myself unappealing by rolling over and playing dead.

I have adapted to living in open areas by running in a zig-zagging pattern to escape danger.

I have six long hairy legs. My quick movements make it hard for my predators to catch me.

When danger approaches I raise my white tail to warn my nearby friends and family.

Answers: Animal Adaptation Clues

Spadefoot Toad

1. A sharp ridge or spade on each of my hind feet helps me dig in the sand.

2. I dig down in the sand and become dormant during hot dry spells (this is called estivation). When it begins to rain the vibrations from the raindrops wake me up.

3. I can mature from egg to adult in only two weeks and I can survive an enormous amount of water loss (up to 40%).

Cottontail Rabbit

1. I have adapted to living in open areas by running in a zig-zagging pattern to escape danger.

2. My grayish-brown fur helps me to blend in with my surroundings; my distant relative, who lives in cold mountain areas, has fur that turns white in the winter.

3. My big ears do more than just pick up sound waves. They also help keep me cool during the summer by radiating heat.

Tiger Beetle

1. My large pincer-like jaws are used to grasp my prey.

2. I have six long hairy legs. My quick movements make it hard for my predators to catch me.

3. I escape the extreme weather conditions of the dunes by digging down 2-3 feet in the sand.

Brown Pelican

1. My large pouch-like bill (it can hold up to 2 gallons of water) is adapted for catching fish.

2. My webbed feet and short legs make me an excellent swimmer, but not very good at walking on land.

3. I flap my pouch to keep cool in the summer (like a dog pants).

Hognose Snake

1. I obtain all my water needs from the toads I eat.

2. When in danger I puff up my neck and hiss loudly to scare my predators away. If that does not work, I make myself unappealing by rolling over and playing dead.

3. I have an upturned snout which I use for digging up toads that have buried into the sand.

Opossum

1. When in danger, I make myself very unattractive to my predator - I defecate, drool, give off a bad smell, and then finally "play dead". They certainly won't want to eat me!

2. My footprint looks like a hand and I have almost no hair on my prehensile tail.

3. As soon as I am born I crawl up to my mother's pouch where I stay until I am 2-3 months old.

Whitetail Deer

1. When danger approaches I raise my white tail to warn my nearby friends and family.

2. When young, white spots on my back look like filtered sunlight and help me to stay hidden from danger.

3. I stamp my hooves and snort loudly to warn others of approaching danger.

VOCABULARY

Adapted, Adaptation - The process of making adjustments to the environment. For example, forests develop only where soil types, moisture and sunlight are balanced to the proper degree. Desert plants have made adjustments, so they are able to live under intense sunlight, on poor quality soils, and with a much-reduced water supply.

Behavior - What an animal does.

Camouflage - To conceal or blend in with the environment to keep from being seen.

Carnivore - A meat eater.

Conservation - The use of natural resources in a way that assures their continuing availability to future generations; the wise and intelligent use or protection of natural resources.

Diurnal - Active by daylight; the opposite of nocturnal.

Ecosystem - All living things and their environment in an area of any size, with all parts linked together by energy and nutrient flow.

Endangered - A species which is in danger of extinction throughout all or a significant portion of its range. (A "threatened" species is one which is likely to become endangered.)

Environment - The total of all the surroundings - air, water, vegetation, human element, wildlife, etc. - that influences you and your existence, including physical, biological, and all other factors; the surroundings of a plant or animal, including other plants and animals, climate, and location.

Estivation - A deep "sleep" some animals enter during drought and/or extreme heat. Estivation is a hot-weather version of hibernation.

Food chain - The transfer of food energy from the source in plants through a series of animals, with repeated eating and being eaten. For example, a green plant, a leaf-eating insect, and an insect eating bird would form a simple food chain. Any one species is usually represented in several or many food chains.

Fur - A thick covering of hair on many mammals' bodies that protects and insulates them.

Habitat - The environmental conditions of an area where a plant or animal naturally grows or lives. These conditions include food, water, shelter (or cover), and area in which to hunt, play, and raise young.

Herbivore - A plant eater.

Hibernation - The act of passing the winter, or a portion of it, in a state of sleep; a torpid or resting state.

Home range - The area in which an animal travels in the scope of normal activities.

Nocturnal - Active by night; the opposite of diurnal.

Omnivore - An animal that eats both plants and animals.

Predator - An animal that kills and eats other animals.

Prey - Animals that are killed and eaten by other animals.

Sand dune - A hill or ridge of (wind-blown) sand.

Scat - Animal droppings; feces; poop.

Shelter - Cover; cover from elements for natal activity, bedding, traveling, breeding, etc.; varies depending upon species.

Sign - Something which suggests the presence or passage of an animal such as its track, droppings, broken branches, etc.

Survive - To remain alive or in existence.

Thicket - Woody vegetation composed of shrubs such as bayberry, small pines and live oaks.

Threatened - In wildlife terms, a species present in its range but in danger because of a decline in numbers and/or habitat.

Track - The impression of a single foot.

Track pattern - A series of tracks showing the sequence of the animal's steps.

Wildlife - Animals that are not tamed or domesticated; may be as small as an organism visible to humans only through a microscope, or as large as a whale. Wildlife includes, but is not limited to, insects, spiders, birds, reptiles, fish, amphibians, and mammals, if nondomesticated.

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Brown Pelican Fact Sheet

Common Name: Brown pelican, Alcatraz, Grand gosier

Scientific Name: Pelecanus occidentalis

Distribution: Brown pelicans are found along the west, gulf and Atlantic coasts of North America.

Description: Brown Pelicans are among the world's largest birds. The average adult body length is 3-5 feet long, with a wing span up to 8 feet and a weight of 5-8 pounds.

Adult birds have a dark brown body and back of neck with a blackish belly. During breeding season, the area above their eyes turns yellow. Newborn pelicans are hatched naked and blind. In 2 1/2 to 3 1/2 weeks, their bodies are covered with soft white down. When fully grown, at 11 to 12 weeks old, they are covered with light grayish-brown feathers with a white belly. After 2 1/2 to 3 years, they develop the adult plumage. The brown pelican can live more than 30 years under ideal conditions.

Habitat: Prime habitats are sounds, beaches and oceans. They often perch on posts and boats. Brown pelicans build their nests in colonies with other pelicans. In North Carolina, the nests are commonly made on the ground.

Food Habits: Brown pelicans feed entirely on marine fish. They either float on the water and lunge at the fish swimming below them, or while flying, spy their food (from as high as 30 feet) and dive head first into the water. As soon as the bill is in the water, it opens, engulfing the fish and up to 2 gallons of water. The water is drained from the pouch and the pelican then swallows the fish.

Behaviors and Adaptations: Brown pelicans are quite active during the day, when they can easily be seen floating in the ocean or sounds. Their short legs and webbed feet make them excellent swimmers. Small groups are often seen flying in single file only a few feet above the water. They are quite social with others of their kind. At night they roost together on ground nests, within their large colonies, usually located on isolated islands or sound areas.

Feathers are very important to the pelican, as they are to all birds. They are adapted for a bird's unique needs, such as insulation and flying.

Wings are another special adaptation. In pelicans, as in all flying birds, the pectorals are very powerful muscles. The special shape of a flying bird's wings give it the lift it needs to get off the ground. The outer tips of the wings act like propellers and rudders allowing upward, downward and forward movement through the air.

Pelicans have large pouch-like bills (which hold up to 2 gallons of water), which are used to scoop up fish (but not to store them). There is a small hook on the end of the beak, and this is used for preening (smoothing and cleaning feathers) and turning eggs in the nest. Pelicans will flap their pouches to cool their bodies (like a dog will pant).

The pelican's webbed feet have four toes, rather than the three typical of other web-footed birds. The third toe has a long claw which is used to preen the back of the neck. The thick webbing is an aid for swimming, and the toes are flexible enough for the bird to be able to perch firmly on a tree limb.

Mortality:

Brown pelicans became one of the many endangered species of the 1940s and 1950s, largely due to the use of the pesticide DDT. Earlier, around the turn of the century, their survival had been threatened by humans shooting them for their feathers. Conservation efforts have enabled the brown pelican to make a substantial comeback and their status has been down-graded to special concern. However, they still have other dangers to contend with such as oil-spills, monofilament line, fish hooks, pesticides and other human-made materials.

Fun Facts:

The brown pelican has the largest pouch of any bird in the world. When a pelican is hot it will flap its bill to cool off.

Pelican young weigh more than their parents for a period before they take flight.

Brown pelicans can fly up to 35 mph in calm winds.

Pelicans have existed for more than 30 million years (humans have existed less than 1 million years).

As young birds, brown pelicans can make a few squawking sounds but become virtually mute as adults. On rare occasions, a low croak may be heard.

Track:

The pattern appears as a web-footed, 4-toed waddle type track.

Eastern Cottontail Fact Sheet

Common Name: Eastern cottontail

Scientific Name: Sylvilagus floridanus

Distribution: It is the most widely distributed member of the genus Sylvilagus in North America. In North Carolina, it is common from the eastern barrier islands to the mountains. Populations fluctuate immensely from region to region and year to year.

Description: The upper body is generally grayish-brown and the underside is white. They have a fluffy tail that is white on the underside. There is a distinct rusty patch on the nape and often a white spot on the forehead, which helps to separate this species from some of the other rabbits in the region. This rabbit usually weighs 2 to 4 pounds, and has a total length of 12 to 19 inches.

Habitat: It lives in heavy brush, strips of forest with nearby open areas, edges of swamps, weed patches and shrub thickets.

Food Habits: This rabbit eats a variety of herbaceous plants during the spring and summer. During the winter, it eats woody plants such as red maple, apple, wild cherry and blackberry.

Behaviors and Adaptations: The eastern cottontail has prolific reproductive capabilities. Mostly active from early evening to late morning, it spends the rest of the day in its burrow. Population fluctuates from one rabbit per four acres to several per acre. Females become rather territorial during breeding season.

When trying to escape danger, the rabbit will run in a zig-zag pattern, making it harder to catch.

Fun Facts: Females have been known to have as many as 7 litters of 4 to 7 young in one year.

Nests are usually constructed from local plant life and lined with fur plucked from the mother's stomach.

The eastern cottontail's ears help the rabbit to stay cool by radiating excess heat.

Track: Rabbits typically have paired prints with the front feet diagonal and the hind feet side by side. The front footprint is 1 inch by 1 inch. The hind foot print is 1 3/4 inches by 3 1/2 inches.

Eastern Hognose Snake Fact Sheet

Common Name: Eastern hognose snake

Scientific Name: Heterdon platyrhines

Distribution: Eastern-central Minnesota to extreme southern New Hampshire; south to southern Florida; west to eastern Texas and western Kansas.

Description: The hognose is a stout-bodied snake with a pointed, slightly upturned snout and wide neck. Color is extremely variable: yellow, tan, brown, gray or reddish with squarish dark splotches on back interspaced with round dark dorsolateral blotches. Solid black is common in some areas. Underside of tail is distinctly lighter than belly color.

The average size is 20 - 33 inches in length. The largest ever recorded measured 45 1/2 inches. The young measure 6 1/4 to 10 inches at hatching.

Habitat: Prefers open sandy-soiled areas, thinly wooded upland hillsides, cultivated fields, woodland meadows. Sea level to 2,500 feet..

Food Habits: Toads are the mainstay, however frogs and salamanders are also eaten. Young snakes may also eat crickets and insects.

Behaviors and Adaptations: The defensive habits of the eastern hognose snake are fascinating. When approached it will flatten its head and neck, inflate with air, and exhale with loud hisses. The snake will make short lunges but does not bite, for the act is all bluff. If poked or kicked, the snake will writhe in apparent agony with mouth and tongue dragging in the dust. Feigned death soon overtakes the poor creature and it lies limply on its back. If the attacker leaves, the hognose snake shortly lifts its head to survey the situation and moves off to safety.

This species is diurnal and follows the scent trails of toads to their daylight hiding places. The snout is used for digging down into the cooler sands, for rooting out the toads, and in other burrowing. Hognose snakes live on land and definitely not in trees. They can swim well, when necessary.

Hognose snakes obtain all the water they need from the toads they eat.

Track: All snakes have a distinctive track that looks somewhat like s-shaped curves.

Gray Fox Fact Sheet

Common Name: Gray fox

Scientific Name: Urocyon cinereoargenteus

Distribution: Occurs over most of the United States except in the North Central and Northwestern regions. Absent from northern Rocky Mountains, Canada and high elevations of western North Carolina. Very common on large barrier islands.

Description: Dog-like in appearance, long muzzle, usually a bushy tail. The scent gland is located at the base of the tail. It has a salt and pepper coat with a median black stripe down a black-tipped tail and black-tipped ears.

An adult averages about 33 1/2 - 40 inches long, including the tail. The average weight is about 7-10 pounds.

Habitat: Strong preference for woodlands and bushy shrubland including pocosins. Individuals seen running on sand rims and ridges between Carolina bays and streamhead forests. Home range is rarely more than 5 miles but the size of the range varies with the season, the diversity of the habitat, the abundance of food and the sex of the animal.

Food Habits: Eats mainly rabbits and rodents, such as mice and voles, but also birds and their eggs, insects, and in-season fruits such as persimmons, grapes, and berries.

Behaviors and Adaptations: They are active throughout the year, chiefly nocturnal and secretive. Their gray color helps camouflage them in the evening twilight; they appear as a shadow quietly passing.

Foxes are intelligent and possess an acute sense of smell and hearing which helps protect them from observation when hunting or being hunted.

The den is usually a hollow log or tree, and occasionally a burrow in the ground. They will climb trees to avoid danger, especially leaning trees, a fact that may possibly be revealed in its trail at times.

Fun Facts: The gray fox is the only fox species that can climb trees. By climbing a tree and jumping down again, a fox can interrupt his trail and confuse his predators while being chased.

The gray fox can run at a speed of 28 mph for short distances.

Track:

Fox tracks are oval and have 4 toes with claws in front of a small heel pad. The track is about 1 5/8 - 1 7/8 inches long. They can be distinguished from dog tracks by evidence of perfect-stepping, the lack of foot drag and the purposefulness of the trail. The gray fox pads on the rear of each foot have a pronounced hook-like projection on each side. A fox straddle measures 4 inches or less. A slow stride measures 8-12 inches and running, 18-36 inches.

Laughing Gull Fact Sheet

Common Name: Laughing gull

Scientific Name: Larus atricilla

Distribution: A permanent resident of the coastal Carolinas and the Atlantic and Gulf coast.

Description: The adult laughing gull is 15 - 17 inches long with a wingspan of about 42 inches. It has a white body and tail, with the back and folded wings a dark gray. In winter, the head molts to a mottled gray and white.

Gulls might be confused with the similarly marked, though smaller, terns. However, in flight, gulls usually direct their bills straight forward, while terns point their bills and heads downward.

Habitat: Laughing gulls live along the seas coasts, and along coastal rivers and lakes. They rarely wander inland.

Food Habits: The laughing gull mainly eats small fish, mollusks and crustaceans, however will eat almost anything. They are very crafty in their eating habits, sometimes alighting on the brown pelican's head and stealing fish from the pelican's pouch. To open a mollusk, the gull will fly high into the air and drop the mollusk onto a hard surface. The gull will repeat this again and again until the shell cracks enough that the meat can be eaten.

Behaviors and Adaptations: Laughing gulls, like all gulls, have webbed feet which are well adapted for swimming, landing, walking and running. This allows them to move easily and quickly on water and on land.

They can drink fresh or salt water, for like most marine birds, they have a pair of glands located above their eyes from which to eliminate excess salt.

Gulls are quite social, roosting in flocks on land or water, and breeding in small or large colonies.

Fun Facts: Both parents will incubate the eggs (typically 3 - 4) and care for the young until they fly and leave the nest.

The "laughing gull" name comes from its call, which sounds like high-pitched cackling laughter. The genus name, Larus, is Latin, from the Greek word meaning a ravenous seabird. The species name is from the Latin words meaning "black tail" (which for laughing gulls, only applies to the immature birds, not to the white-tailed adults).

For easy identification, the laughing gull is the only black-headed gull commonly found in North Carolina.

Tracks: The laughing gull track shows a webbed foot with three toes; the fourth, or hind toe, rarely imprints. The track is 1 1/2 inches by 2 inches.

Opossum Fact Sheet

Common Name: Opossum, Virginia opossum

Scientific Name: Didelphis virginiana

Distribution: The Virginia opossum is abundant in the southeastern United States and is found throughout the Carolinas, Virginia, and Maryland.

Description: The Virginia opossum has a long, pointed, pinkish nose. Its face is white with large, leaf-like ears. The tail is almost as long as the body and is basically hairless, mottled pink and black, and rounded. The fur is pale gray in northern states, but becomes much darker in southern states.

The head and body average 12 - 20 inches, and the tail is usually 10 - 15 inches long. They weigh 4 - 8 pounds.

The Virginia opossum may live 3 years under ideal conditions.

Habitat: Opossums are extremely adaptable. They prefer farmlands, but are also found in woodlands, along streams, and in towns. Their home range is 15 - 40 acres.

Food Habits: Opossums are omnivores; the skull contains 50 various teeth. Their standard diet contains fruit, vegetables, nuts, meat, eggs, insects, and carrion.

Behaviors and Adaptations: Mostly nocturnal, opossums are often entranced by headlights when attempting to cross a road, and therefore are commonly found dead by the roadside. They usually take up residence in old dens, hollow logs, and beneath buildings. The prehensile tail is hairless, extremely strong, and is sometimes used as a "fifth hand". When cornered they will sometimes defecate, drool, give off a bad smell or feign death, but can also be very fierce animals. These animals are most active in spring and summer. They tend to be nomadic and to lead solitary lives.

When born, each baby uses its front feet and claws to crawl the 2 to 3 inches to the pouch and then attaches itself to a nipple. They remain attached for about 60 days and leave the pouch after about 80 days.

Fun Facts: The gestation period is only 12 to 13 days, and the young are weaned in 80 - 100 days. The mother may give birth to up to 21 offspring, but the average living litter will be about 9 - 12.

It is the only marsupial, or pouched animal, native to the United States.

It has more teeth (50) than any other mammal in North America.

When cornered, the opossum may "play dead," (hence the expression, "playing possum"). Sometimes it stays in this trance-like state for up to 6 hours.

Opossum fossils date back to Upper Cretaceous time. It is among the most primitive of living mammals.

Track: There are five toes on front and hind feet, and claws on all toes, except on the opposable "thumb" on the hind foot. The track is usually 2 inches long. A tail mark is usually seen.

Raccoon Fact Sheet

Common Name: Raccoon, Coon, Ringtail

Scientific Name: Procyon lotor

Distribution: Raccoons occur throughout the United States from the Atlantic to the Pacific, from the southern states to lower Canada. Throughout the Carolinas, Virginia and Maryland, they are particularly abundant in the coastal plain but less plentiful in the piedmont and mountains.

Description: The brownish black bandit mask, gray to brownish grizzled fur and conspicuous ringed tail make the raccoon one of the most easily identified mammals. Fur is relatively long, giving raccoons a "roly-poly" appearance. Fur color is usually gray in inland populations, but may be brownish in those animals inhabiting coastal marshes.

In adults, the head and body measure 12-18 inches; tail 8-12 inches. They weigh 8 - 20 pounds.

Habitat: An inhabitant mainly of the forests, and frequently found hidden in trees, the raccoon is frequently associated with wetland habitats, especially along the coast. It can also be found on sand dunes, and in suburban neighborhoods, having a home range from ten acres to several square miles.

Food Habits: In general, raccoons will eat just about anything they can get their paws on. Raccoons are omnivorous. They feed mostly along streams and lakes ingesting crayfish, earthworms, frogs, turtles (and their eggs), salamanders and other small aquatic animals and insects. In the summer and fall, raccoons feed more on vegetable matter, fruits and nuts. In southern areas during winter, the raccoon will feed on small mammals.

Behaviors and Adaptations: Raccoons are noted for washing their food. However, studies indicate this behavior is not related to cleanliness at all but the water serves to help their sensitive fingers distinguish between food and rocks or other objects.

They den up in hollow logs, rock crevices or ground burrows during extreme cold spells in the southern region. The raccoon may even become dormant in the North but it does not hibernate.

Fun Facts: Raccoons living in urban areas may open and raid garbage cans at night in search of food.

Raccoons may sometimes use a chimney for a den and the sounds of the young may be heard through the flue of the fireplace.

Sometimes the young fall from tree dens as high up as 20 feet but will usually be retrieved by the mother without any injuries.

Track: The raccoon makes 2-3 inch long tracks that look like a series of small hand-prints. The long finger-like toes on their tracks are their most recognizable and distinctive feature. The track pattern of the raccoon shows the large hind track placed next to the smaller front track of the opposite side. Their tracks are often found in the mud along streams, swamps and lakes.

Spadefoot Toad Fact Sheet

Common Name: Spadefoot toad

Scientific Name: Scaphiopus holbrooki

Distribution: Spadefoot toads are found from south New England to southern Florida and some of the Keys; west to southeast Missouri, northeast Arkansas and eastern Louisiana; absent from most upland areas in the South.

Description: Spadefoot toads have stout bodies, the throat and chest are white, and they range from 1 3/4 to 3 1/4 inches long. The front feet are slightly webbed and the hind feet have the sickle or wedge-shaped "spade" on the inner side. The toad's eyes have vertical pupils, and often extending backward from them are irregular pale or yellow lines.

Their vocal sound is an explosive, low-pitched grunt, short in duration, every two seconds. Some persons liken the sound to that of a crow.

Habitat: Sand; sandy, gravelly or loamy soils; from farmland to forest.

Food Habits: They usually feed at night on insects and other small animals.

Behaviors and Adaptations: The spadefoot toad uses small spades on its hind feet to dig burrows in sand or loose dirt. This is done to avoid predators and the hot sun. In periods of little or no rainfall, it may become dormant and, covering itself with a jelly-like substance, may stay underground for several weeks until the vibrations from raindrops wake it. The dormant period is known as estivation. Because these toads live in areas where water may only stay on the ground for short periods of time, they can mature from egg to adult in only two weeks, and can survive enormous amounts of water loss.

Many people have strong allergic reactions from handling this toad. The yellow lines on the back should serve as a warning.

Track: The spadefoot toad's front and rear prints are paired. The front pair face inward. The whole track is 1/2 by 1 inch.

Tiger Beetle Fact Sheet

Common Name: Tiger beetle

Scientific Name: Cicindelidae hirticolis

Distribution: Tiger beetles are considered summer insects. Most of them are sun-loving species found on beaches and dry soil. They range throughout North America, and depending on the species, can be found from the Eastern United States to Montana and Oregon and as far north as Canada.

Description: This black and white bodied beetle has long hairy legs, strong wings, and long antennae that rise from the top of the head. Its eyes are quite large and bulbous, and it has a pincer-like jaw. It is a swift and agile runner and is difficult to catch.

The different species of tiger beetle range from 3/8 - 7/8 inches; the smallest is the dainty tiger beetle, and the largest is Dejean's flightless tiger beetle (not found in the eastern U. S.).

Habitat: Sandy places with scattered vegetation.

Food Habits: The tiger beetle mainly eats small insects and spiders, but has also been known to eat small fiddler crabs. All adults are ferocious predators that seize small insects with powerful pincer-like jaws. They bang the prey against the ground several times until it is dead, then they suck the juices out and chew parts of the body shell.

The voracious larvae digs a hole in the sand, fastens itself near the top of the tunnel and plugs the opening with its enormous head. As an unsuspecting insect walks by, the tiger beetle larvae springs out in a partial backwards somersault, grabs the prey in its powerful pincer-like jaws and drags it into the burrow.

Behaviors and Adaptations: The tiger beetle escapes the extreme weather conditions of the dunes by digging a burrow 2 - 4 feet deep in the sand. The quick movements of the adult tiger beetle make it hard for predators to catch.

Fun Facts: All beetles are worth noting due to their large numbers. If every plant and animal species sent a representative to a convention, one out of every five delegates would be a beetle. Specifically tiger beetles are not harmful to plants as they do not eat plant/crops nor do they lay eggs on vegetation.

Track: The tiger beetle leaves a print which looks like someone took a pencil and lightly moved it through the sand and then put many tick marks on either side. The track can be relatively straight or zig-zagging.

White-tailed Deer Fact Sheet

Common Name: White-tailed deer

Scientific Name: Odocoileus virginianus

Distribution: The white-tailed deer occurs in most forests, forest edges and bushy areas and is found in all the 48 contiguous states. It is more common in the coastal plain of North Carolina than in the piedmont or mountains.

Description: White-tailed deer average 3 feet in length and 3-3 1/2 feet tall. The weight averages about 125 pounds in males; females are somewhat smaller. White-tailed deer from most coastal areas are smaller than those from the mainland. The coat color is generally reddish brown in summer and, after molting, takes on a grayish brown color in winter. There is a white patch on the throat and a white band across the nose. They are easily identified by the completely white underside of the tail, which is usually elevated when the deer runs from danger. The white-tailed deer lives approximately 5 - 10 years in the wild.

Habitat: Prime habitat is broken areas of mixed young forests, old fields and crop lands typical of the rural portions of North Carolina. On the Outer Banks white-tailed deer live in the maritime forest and surrounding thicket areas. They remain in a fairly fixed home range of about 2 to 3 square miles.

Food Habits: White-tailed deer feed primarily at dawn and dusk but often feed at night and during daylight hours as well. They graze on green plants, including aquatic ones, in the summer, eat acorns, beechnuts and other nuts and corn in the fall, and in winter, browse on woody vegetation, including viburnum, birch, maple and many conifers.

Behaviors and Adaptations: Deer are primarily nocturnal animals, although they are somewhat active during the daytime hours. They feed mostly at night, beginning at dusk and ending at dawn. During the day, they bed down in secluded forest areas where they are easily concealed. Fallen trees or shrub thickets seem to be the more favored bedding areas.

To warn other deer of approaching danger, they snort loudly and stamp their hooves. The white-tail "flag" of the deer during flight is a warning to other deer that danger is nearby. The "flag" also helps a fawn keep track of its mother running ahead.

The color change of an adult deer's coat is a good example of camouflage adaptation. As the color changes from reddish-brown (summer) to grayish-brown (winter) it provides a greater camouflage protection against the bare

tree trunks. The summer hairs are solid, fine, and short to allow for cooling, while winter hairs are long, coarse, waxy and hollow. Short, fuzzy underfur helps insulate.

Fawns, also, are protected from predators by their coloration. White spots (which look like sunlit areas) conceal fawns as they lie motionless in grasses, often separated from their mother as she feeds nearby.

Fun Facts:

A deer's antlers are very specialized. It is the mammal world's only example of regularly regenerated body parts. Antlers, unlike horns, are bone.

Antlers are recycled. Animals, such as mice and squirrels, like to chew on the antlers, which contain calcium and other minerals the rodents need.

White-tails can run up to 35-40 mph. They can jump 8 1/2 feet vertically from a standing-still position and jump 30 feet horizontally.

Track:

When galloping, the white-tail deer uses the "rocking horse" gait, common among large animals, in which the hind feet swing far ahead of the front foot tracks. Deer tracks show two toes in a heart-shaped print, but often not well defined. Length varies from 1 1/2 to 3 inches; the smallest prints belong to fawns and largest to mature bucks. When walking, deer place their hind feet in or near the prints of their forefeet, so prints often overlap.

SCHEDULING WORKSHEET

Date request received_____ Request received by_____

1) Name of group (school) _____

2) Contact person _____ _____
name phone (work) (home)

_____
address

3) Day/date/time of requested program _____

4) Program desired and program length _____

5) Meeting place _____

6) Time of arrival at park _____ Time of departure from park _____

7) Number of students _____ Age range (grade) _____

8) Number of chaperones _____

9) Areas of special emphasis _____

10) Special considerations of group (e.g. allergies, health concerns, physical limitations)_____
_____

11) Have you or your group participated in park programs before? If yes, please indicate previous programs attended: _____
_____
If no, mail the contact person an Educator's Guide.

12) Are parental permission forms required? _____ If yes do you have these forms? _____
If not, mail contact person a Parental Permission form.

I, _____, have read the entire Educator's Guide and understand and agree to all the conditions within it.

Return to: Jockey's Ridge State Park
P. O. Box 592
Nags Head, North Carolina 27959

PARENTAL PERMISSION FORM

Dear Parent:

Your child will soon be involved in an exciting learning adventure - an environmental education experience at _____. Studies have shown that such "hands-on" learning programs improve children's attitudes and performance in a broad range of school subjects.

In order to make your child's visit to "nature's classroom" as safe as possible we ask that you provide the following information and sign at the bottom. Please note that insects, poison ivy and other potential risks are a natural part of any outdoor setting. We advise that children bring appropriate clothing (long pants, rain gear, sturdy shoes) for their planned activities.

Child's name _____

Does your child:

- Have an allergy to bee stings or insect bites?_____
  If so, please have them bring their medication and stress that they, or the group leader, be able to administer it.

- Have other allergies? _____

- Have any other health problems we should be aware of?_____
  _____

- In case of an emergency, I give permission for my child to be treated by the attending physician. I understand that I would be notified as soon as possible.

_____ _____
Parent's signature date

Parent's name _____ Home phone _____
(please print) Work phone _____

Family Physician's name _____ phone _____

Alternate Emergency Contact

Name_____ phone _____

NORTH CAROLINA PARKS & RECREATION
PROGRAM EVALUATION

Please take a few moments to evaluate the program(s) you received. This will help us improve our service to you in the future.

1. Program title(s) _____ Date _____
   Program leader(s) _____

2. What part of the program(s) did you find the most interesting and useful? _____
   _____

3. What part(s) did you find the least interesting and useful? _____
   _____

4. What can we do to improve the program(s)? _____
   _____
   _____

5. General comments _____
   _____
   _____
   _____

LEADERS OF SCHOOL GROUPS AND OTHER ORGANIZED YOUTH GROUPS
PLEASE ANSWER THESE ADDITIONAL QUESTIONS:

6. Group (school) name _____

7. Did the program(s) meet the stated objectives or curriculum needs? _____
   If not, why? _____
   _____

Please return the completed form to park staff. Thank you.

Jockey's Ridge State Park
P. O. Box 592
Nags Head. North Carolina 27959

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